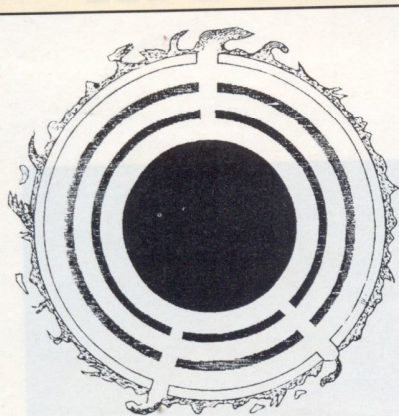


recent letter. In this letter, Elliott had opined that there were living beings on the Sun. Simmons referred to a passage in which Elliott asserted that the Sun was not a body of fire, but that its light proceeded from a dense and universal aurora which may have afforded light to the inhabitants of the surface beneath 'and yet be at such a distance aloft as not to annoy them'. Indeed, Elliott wrote further - about Solar vegetation, possible water, dry land, hills and dales, and the delights of a world where it was always summer.



Herschel's Sun: A Victorian refinement with two insulating layers

The Recorder was unimpressed, and observed dryly that if a belief in life on the Sun were evidence of insanity, then 'the same proof might hold good with respect to some other theorists'. This comment - a reference to contemporary speculations by astronomers and others on the possibility of Solar life - was very precocious in that the Solar life hypothesis was indeed soon to be adopted, within eight years, by Sir William Herschel, the most prestigious astronomer of the day.

### Sun gods

There have been three main phases of speculation about life on the Sun. The first was the pre-scientific era in which the Sun was perceived as a god, or possibly the home of gods, or even as the parent of gods. The archaeologist Jacquetta Hawkes wrote of the early Christian era: 'Almost everyone, except Gnostics, Christians, Jews and a few incorrigible sceptics, believed the Sun, Moon, Planets and fixed stars to be "gods visible and created", the "heavenly race of gods". Thus Sol, or its offspring, was worshipped in Egypt and Babylon, Mexico and Peru.'

The second phase was marked by scientific study of

it not, within considerable bounds of imagination it might have been able to imagine it.

### The plurality of worlds

Pluralism, the belief in life on other worlds - the 'plurality of worlds' as the phrase went - was very popular in the first half of the nineteenth century. Pluralists were generally content with the idea of life, intelligent or otherwise, on planets other than Earth. They sometimes speculated about life on these planet's satellites - even on comets - but they generally drew the line at the idea of life on stars like the Sun. The theme of Solar or stellar life became the high-point of hard-line pluralism, but remained a minority belief - a doctrine of ETI (extraterrestrial intelligence) with no holds barred.

Even though the idea of the existence of 'Solarians' living on the Sun has been given little attention in the age-old debate of SETI (the search for extraterrestrial intelligence), it has often displayed considerable ingenuity and fertility of imagination. First, it has followed astronomical developments closely - broadly speaking, the more people learned about the nature of the Sun, the less they became inclined to accept the suggestion that it was an abode of life. Second, the Solarian debate provides a clear example of the ambivalent, often confused nature of SETI discussions with regard to the actual nature and definition of life and intelligence. 'Setists' as we may term them tend to be divided: those who assume that 'life out there' must resemble life here, or at least be a close approximation to it; and those who are prepared for it to be strikingly different in form or origin from that with which we are familiar on Earth. Writers have often vacillated between the two positions.

### Herschel's claim to life on the Sun

Sir William Herschel, discoverer of the planet Uranus in 1781 and court astronomer to George III, launched his own Solarian life theory in two papers submitted to the Royal Society in 1795 and 1801; his particular line on the subject was to remain the best known and longest-lived of its kind, inspiring other theorists for nearly a century. He made his suggestions to a scientific world which was already well prepared for them.

Herschel was an enthusiastic convert to pluralism, a keen follower of arguments put forward by the Scottish astronomer James Ferguson whose widely read book (*Astronomy Explained*, 1756) upon Sir Isaac Newton's *Principles* contained such passages as: 'All planets and Moons in the (Solar) System are designed as commodi-

inhabitants - the Solarians - might be 'beings whose organs are adapted to the peculiar circumstances of that vast globe'.

By 1801 he had refined and improved his theory. He now suggested that there were two cloud layers encircling the Sun. The outer one was fiercely hot and luminous - the one we observe from Earth. Beneath it lay another shell of thick, insulating cloud, the upper surface of which reflected back the heat of the outer layer. Herschel calculated that the inner cloud filtered-through seven parts in a thousand of the rays falling upon it, quite enough to supply the huge world beneath with sufficient heat and light to sustain life. Both cloud layers were kept aloft by an atmosphere 27 times as dense as that on Earth.

In spite of the prestige of its author, Herschel's Solarian theory came in for considerable criticism and was not widely adopted, except by a handful of hard-line pluralists. (Even Herschel may have wavered; the Royal Society minutes of 1801 note that 'the Doctor (Herschel) seems aware of some fallacy in this mode of argumentation...') In 1807, Thomas Young wrote in his *Natural Philosophy* that no cloud layer, however dense, could protect the Solarians from the impact of the Sun's fiery shell. He went further to say that, in any case, the Sun's gravity was such that 'a man of moderate size would weigh two tons'. This last point, an early example of the 'refutation by weight' argument, failed to address Herschel's contention that Solarians might, in any case, be very differently constructed from homo sapiens. This anatomical non-debate was to reappear repeatedly in the years ahead.

The moderate pluralists shied away from the Herschel line. David Brewster, who edited a new edition of Ferguson's famous work in 1821, thought it 'inconceivable that the feeble barrier of planetary clouds could shield the subjacent mass from the destructive elements that raged above'. He also felt that Herschel's other assertions about life on the Sun were based on an inappropriate analogy with life on planets, which were very different kinds of heavenly bodies.

The Solar life hypothesis after Herschel ...

Herschel was not alone, however. Even before he had produced his theory, other astronomers had speculated similarly, for example the German Johann Bode wrote as early as 1776 that the Sun might have a cool, protected core on which 'fortunate inhabitants, say I, are illuminated by unceasing light'. An English author, Gowin Knight had wondered in 1754 whether the Sun and stars might be cool enough to sustain life: 'Their

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